

## CLAIMS

1. An exhaust purifying apparatus for an internal combustion engine, **characterized by:**

5        an exhaust purifying mechanism that is located in an exhaust passage of the internal combustion engine, wherein the exhaust purifying mechanism traps particulate matter in exhaust gas;

10       a fuel adding device for adding fuel to exhaust gas that passes through the exhaust purifying mechanism;

      a detecting section that detects a pressure difference between a section upstream and a section downstream of the exhaust purifying mechanism;

15       a comparing section, wherein, while the fuel adding device is adding fuel to exhaust gas, the comparing section compares the pressure difference that is detected by the detecting section at a predetermined point in time with the pressure difference reference value that has been set in correspondence with the predetermined point in time; and

20       a setting section, wherein, when the comparing section determines that the pressure difference exceeds the pressure difference reference value, the setting section sets the manner of adding fuel of the fuel adding device to intermittent fuel addition.

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2. The exhaust purifying apparatus according to claim 1, **characterized in that** the predetermined point in time is a first point in time, and the pressure difference reference value is a first pressure difference reference value, and  
30       wherein, after the setting section sets the manner of adding fuel to the intermittent fuel addition, the comparing section compares the pressure difference that is detected by the detecting section at a second point in time that is different from the first point in time with a second pressure difference  
35       reference value that has been set in correspondence with the

second point in time.

3. The exhaust purifying apparatus according to claim 2,  
**characterized in that**, when the pressure difference detected  
5 at the second point in time becomes equal to or less than the  
second pressure difference reference value, the setting  
section ends the intermittent fuel addition.

4. The exhaust purifying apparatus according to claim 1,  
10 **characterized in that**, when an estimated accumulation amount  
of particulate matter in the exhaust purifying mechanism  
becomes zero after setting the manner of adding fuel to the  
intermittent fuel addition, the setting section ends the  
intermittent fuel addition.

15 5. The exhaust purifying apparatus according to claim 1,  
**characterized in that**, after setting the manner of adding fuel  
to the intermittent fuel addition, the setting section sets  
the fuel addition of the intermittent fuel addition to be  
20 performed a predetermined number of times.

6. The exhaust purifying apparatus according to any one  
of claims 1 to 5, **characterized in that** the predetermined  
point in time includes a point in time at which an estimated  
25 accumulation amount of particulate matter in the exhaust  
purifying mechanism becomes equal to or less than a threshold  
value.

7. The exhaust purifying apparatus according to any one  
30 of claim 1 to 6, **characterized by** an estimating section and a  
correction section, wherein the estimating section estimates  
the amount of noncombustible matter in the exhaust purifying  
mechanism based on the pressure difference detected when the  
intermittent fuel addition is ended, and wherein the  
35 correction section corrects the pressure difference detected

by the detecting section based on the amount of noncombustible matter estimated by the estimating section.

8. The exhaust purifying apparatus according to any one  
5 of claim 1 to 6, **characterized by** an estimating section and a correction section, wherein the estimating section estimates the amount of noncombustible matter in the exhaust purifying mechanism based on the pressure difference detected when the intermittent fuel addition is ended, and wherein the  
10 correction section corrects the pressure difference reference value based on the amount of noncombustible matter estimated by the estimating section.

9. The exhaust purifying apparatus according to claim 7  
15 or 8, **characterized in that** the estimating section estimates the amount of noncombustible matter based on the pressure difference detected when the preceding intermittent fuel addition was ended and the pressure difference when the current intermittent fuel addition is ended.

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10. The exhaust purifying apparatus according to any one of claims 1 to 9, **characterized in that**, when an intake air amount of the internal combustion engine is equal to or more than a predetermined amount, the comparing section compares  
25 the pressure difference with the pressure difference reference value.

11. The exhaust purifying apparatus according to any one of claims 1 to 9, **characterized in that**, when an intake air  
30 amount of the internal combustion engine is equal to or more than a predetermined amount, the detecting section detects the pressure difference between a section upstream and a section downstream of the exhaust purifying mechanism.

35 12. The exhaust purifying apparatus according to any one

of claims 1 to 11, **characterized in that** the pressure difference reference value is increased as the intake air amount of the internal combustion engine is decreased.

5        13. The exhaust purifying apparatus according to any one of claims 1 to 12, **characterized in that** the pressure difference includes an average value of pressure differences detected during a period from the point in time until a predetermined time elapses.

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14. The exhaust purifying apparatus according to any one of claims 1 to 12, **characterized in that** the pressure difference includes a value obtained by smoothing pressure differences detected during a period from the point in time  
15 until a predetermined time elapses.

15. The exhaust purifying apparatus according to any one of claims 1 to 14, **characterized in that** the exhaust purifying mechanism includes an exhaust purification catalyst through  
20 which particulate matter in exhaust gas passes and an exhaust purifying member that is located downstream of the exhaust purification catalyst and traps the particulate matter, and wherein the detecting section detects a pressure difference between a section upstream and a section downstream of the  
25 exhaust purifying member.

16. A method for purifying exhaust gas of an internal combustion engine, **characterized by:**

trapping particulate matter in exhaust gas by an exhaust  
30 purifying mechanism located in an exhaust passage of the internal combustion engine;

adding fuel to exhaust gas that passes through the exhaust purifying mechanism;

detecting a pressure difference between a section  
35 upstream and a section downstream of the exhaust purifying

mechanism;

comparing the pressure difference that is detected at a predetermined point in time with a pressure difference reference value that has been set in correspondence with the  
5 predetermined point in time, while the fuel addition is being executed; and

setting the manner of adding fuel to intermittent fuel addition when it is determined that the pressure difference exceeds the pressure difference reference value.